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# PATENT SPECIFICATION

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## (54) IMPROVEMENTS IN AND RELATING TO THE MANUFACTURE OF SCREW THREADED COMPONENTS

(71) We, ARCHIBALD KENRICK & SONS LIMITED, a British Company, of P.O. Box 9, West Bromwich, in the County of Stafford, do hereby declare the invention for which we pray that a Patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to the manufacture of components of the kind comprising a stem which is provided at a location intermediate its ends with a part in the form of a nut and has portions projecting from opposite sides of the nut, at least one of said portions being externally screw threaded and the nut part facilitating turning of the component for the purpose of engaging the screw thread with an internally screw threaded bore. A component of this kind will hereinafter be referred to as a component of the kind specified.

The invention has been devised primarily in connection with the production of pivot pins for use in swivel castors, for example furniture castors, such a pivot pin mounting the swivelling assembly of a castor and being intended to be attached to an article of furniture by fitting of its screw threaded portion into a complementarily screw threaded bore in the article. It is to be understood, however, that there is no limitation in this regard.

Components of the kind specified are conventionally produced with the nut part integral with the stem either by forming from lengths of wire or by turning from solid metal blanks, but these conventional methods present various disadvantages. Specifically the first method necessitates the use of a soft metal which is unsuitable in, for example, the mounting of a castor since it is liable to bend in use; moreover this method frequently results in the components having a rough finish which is dangerous when they are handled. The second method involves a considerable wastage of material and is accordingly expensive.

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With the object of eliminating these disadvantages, according to a first aspect of the present invention we provide an improved method of manufacturing a component of the kind specified which comprises forming as initially separate parts a stem and a nut, assembling these parts so that the nut is held on the stem by a friction fit, and then forming a screw thread on at least one of the portions of the stem projecting from opposite sides of the nut.

It will be appreciated that this method considerably simplifies the manufacture of components of the kind specified and can therefore be practised inexpensively. The parts can be readily prefabricated of a hard metal and with a smooth finish.

All the operations which are required in the formation of the stem, except the screw threading operation, are conveniently performed prior to fitting of the nut on to the stem. Thus, in the case of a pivot pin for mounting the swivelling assembly of a swivel castor and in which the portion of the stem at one side of the nut is screw threaded from the nut right to the extremity of the stem and the portion at the other side of the nut is plain, before assembly of the parts at least the portion which is to be screw threaded may be reduced at its extremity and the portion to be left plain may be formed with at least one circumferential groove. In use the groove or one of the grooves receives a circlip which secures the swivelling assembly to the pivot pin and the screw threaded portion is fitted in a bore in an article of furniture. The said operation may be performed automatically by means of a lathe.

The stem may be produced from a parent length of metal rod, a piece of the appropriate length being cut off this rod

before assembly of the stem and the nut and preferably after the operations mentioned above in the case of a pivot pin for a castor.

5 The nut may be prefabricated in any conventional manner but preferably does not have an internal screw thread.

10 In order to provide the friction fit between the stem and the nut, the stem is preferably formed with a circumferential knurled band at the intended location of the nut. This operation which may be performed by a rolling process, conveniently takes place after cutting of the stem from the parent length. Since the nut will be required to apply a considerable amount of torque to the stem when the latter is being screwed into a bore, the knurling is preferably of a coarse nature.

20 Fitting of the nut on to the stem is preferably effected by a pressing operation.

The formation of a screw thread on the portion of the stem of the assembled component at the or each side of the nut, which may be effected by a rolling process, may be performed either immediately after the assembly operation or at a later stage in the event of, for example, a customer's requirements as to the type of thread required not being known at the time.

30 According to a second aspect of the invention we provide a component of the kind specified wherein the nut and the stem are initially separate, assembled parts, the nut being provided with a plain bore which is frictionally engaged with the stem to hold the nut thereon, and the stem being of cylindrical form throughout its length and at least one of the portions thereof projecting from opposite sides of the nut being provided with a screw thread formed after assembly of the nut and the stem.

40 Although it is primarily intended that the stem shall be screw threaded at only one side of the nut, if desired it may be screw threaded at both sides, the threads being for example of opposite hands.

The invention will now be described by way of example with reference to the accompanying drawings in which:

50 FIGURE 1 is a side elevation of a stem to receive a nut in the production of a pivot pin for a furniture castor, and

FIGURE 2 shows the finished pivot pin.

55 The pivot pin illustrated in the drawing comprises a stem generally designated 1 formed at a location intermediate its ends with a circumferential band of coarse straight knurls 2 (Figure 1) around which is fitted a nut 3 having a plain bore, the knurling providing a friction fit of the nut on the stem. The portion 4 of the stem at one side of the nut 3 has its extremity 5 reduced and is formed with a screw thread 6 (Figure 2) which extends from the nut right to the reduced extremity 5. The portion 7 of the

stem at the other side of the nut has its extremity 8 reduced and is formed with two spaced circumferential grooves 9 and 10.

The component is produced in the following manner. A metal rod is first turned on a lathe so as to produce the reduced extremities 5 and 8 and the grooves 9 and 10 of the intended stem. The stem is then cut from the parent length of rod and the knurled band 2 is thereupon formed by a rolling process. The nut 3 is then pressed on to the stem 1 over the portion 4 to which the screw thread 6 is to be applied, so that its bore is frictionally engaged with the knurled band 2 and the nut is thus firmly held on the stem. Finally, the screw thread 6 is formed on the portion 4 of the stem by a rolling process.

When the pivot pin is fitted to a swivel castor the plain portion 7 is received in a bore in the castor body and the groove 9 receives a circlip which holds the body on the pin. The screw threaded portion 4 is intended to be screwed into a complementarily screw threaded bore in an article of furniture.

#### WHAT WE CLAIM IS:—

1. A method of manufacturing a component of the kind specified which comprises forming as initially separate parts a stem and a nut, assembling these parts so that the nut is held on the stem by a friction fit, and then forming a screw thread on at least one of the portions of the stem projecting from opposite sides of the nut.

2. A method as claimed in Claim 1 wherein all the operations required in the formation of the stem, except the screw threading operation, are performed prior to fitting of the nut on to the stem.

3. A method as claimed in Claim 1 or Claim 2 applied to the production of a pivot pin for mounting the swivelling assembly of a swivel castor and in which the portion of the stem at one side of the nut is screw threaded from the nut right to the extremity of the stem and the portion at the other side of the nut is plain, wherein before assembly of the parts at least the portion which is to be screw threaded is reduced at its extremity and the portion to be left plain is formed with at least one circumferential groove.

4. A method as claimed in any one of the preceding claims wherein the stem is produced from a parent length of metal rod, a piece of the appropriate length being cut off this rod before assembly of the stem and the nut.

5. A method as claimed in Claims 3 and 4 wherein the operations of reducing the extremity of at least the portion of the stem which is to be screw threaded and of forming at least one circumferential groove in the portion of the stem to be left plain are performed before the stem is cut from the parent length of rod.

6. A method as claimed in any one of the preceding claims wherein before fitting of the nut to the stem the latter is formed with a circumferential knurled band at the intended location of the nut, this band providing the friction fit between the stem and the nut. 20
- 5 7. A method as claimed in Claims 4 and 6 wherein the operation of forming the knurled band is performed after cutting of the stem from the parent length of the rod. 25
- 10 8. A component of the kind specified wherein the nut and the stem are initially separate, assembled parts, the nut being provided with a plain bore which is frictionally engaged with the stem to hold the nut thereon, and the stem being of cylindrical form throughout its length and at least one of the portions thereof projecting from opposite sides of the nut being provided with a screw thread formed after assembly of the nut and the stem. 30
- 15 9. A method of manufacturing a component of the kind specified substantially as herein described with reference to the accompanying drawings.
10. A component substantially as herein described with reference to, and as illustrated in Figure 2 of the accompanying drawings.

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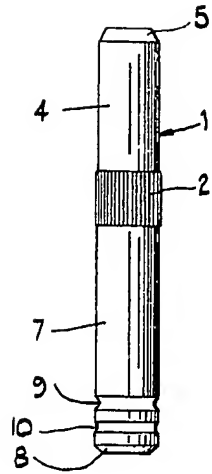


FIG 1

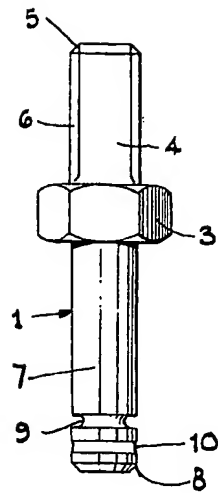


FIG. 2.